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### STUDIES IN ISOCHILUS, MORMODES AND HEXALECTRIS

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#### I. THE GENUS ISOCHILUS

IN 1813, Robert Brown proposed the genus *Isochilus* based on *Epidendrum lineare* Jacquin. Since 1813, twenty-nine additional species have been assigned to the genus. Sixteen of these species have been transferred to other genera. The remaining fourteen appear to be reducible to two species, each of which includes two varieties.

All of the entities retained in *Isochilus* are very closely related to one another. However, allowing for intermediate plants, the genus may be divided into two rather distinct categories—(1) plants possessing a typically compact unilateral inflorescence (*I. major*) and (2) plants possessing a typically loose distichous or occasionally laxly unilateral inflorescence (*I. linearis*).

A less critical treatment of the genus would perhaps result in placing both *I. major* and *I. linearis* in one polymorphic species. However, if typical *I. linearis* is compared with typical *I. major*, this procedure would seem to be extremely radical. Hence, always bearing in mind the extreme variability of the genus as a whole, it seems best to recognize in the genus several groups exhibiting more or less similar and constant characters.

As is the case with many other species included in the subtribe Ponereae, the segregates in *Isochilus* are on the whole more readily distinguished from one another on vegetative rather than on floral characters. The flowers of the various segregates have no constant characters whereby they may be easily distinguished. They may consist of a graduated series from large to small, and the freedom or adnation of the sepals may vary considerably even among flowers in the same raceme.

According to J. A. Steyermark, plants of *Isochilus* are used in Guatemala in the treatment of colic, dysentery and other intestinal disorders. The species are commonly known as "Calaqual", "Sanguinaria", "Nido de Pajaro" and "Cresta de Gallo".

The key has been arranged so as to show the relationships of the various segregates. Extremes which represent the typical entities retained are easily eliminated through the use of the key. However, it must be admitted that intergrades are found between those forms connected by arrows in the key.

In order to make this paper more complete, all of the species erroneously assigned to the genus *Isochilus* have been included at the end of the paper where their present status is indicated.

***Isochilus*** *R. Brown* in Aiton Hort. Kew. ed. 2, 5 (1813) 209.

*Leptothrium* Kunth in Humboldt, Bonpland and Kunth Nov. Gen. & Sp. 1 (1816) 340, non Kunth Rév. Gram. (1830) 156.

*Isochilos* Sprengel Syst. Veg. 3 (1826) 734, in part.

Caespitose or repent epiphytic, terrestrial or rock-inhabiting plants with slender stems and numerous distichous leaves, the rhizomes concealed by dark brown warty sheaths. Leaves strictly erect to spreading, linear,



lanceolate or oblong, more or less retuse at the apex, rigidly membranaceous to subcoriaceous. Inflorescence a terminal densely or loosely flowered unilateral or distichous raceme of one to many flowers. Floral bracts short or elongated, suborbicular to oblong, paleaceous. Flowers small, variously colored from nearly white to deep rose-purple, with short pedicellate ovaries, often partly concealed by the subtending bracts or upper leaves. Sepals subequal, erect or recurved, concave, varying from free to coherent almost to the apex, gibbous at the base under the lip, more or less dorsally carinate along the mid-nerve or occasionally broadly winged on the back (especially the lateral ones), free part elliptic to lanceolate and obtuse to subacuminate. Petals with a slender claw, a little shorter and broader than the sepals, ecarinate, oblique, oblong-lanceolate, elliptic or obovate. Lip with a short claw, subequal to the petals but narrower, adnate to the base of the column or the short column-foot, linear to linear-ob lanceolate, obtuse to acute, commonly sigmoid-flexuose below or slightly above the middle or both, sometimes constricted near the middle, variously marked on the claw and at about the middle of the lamina. Column erect, semiterete, wingless, toothed at the apex, apparently footless or produced at the base into a short inconspicuous foot; anther terminal, operculate, incumbent, 2-celled; pollinia four, waxy, ovoid-oblong, elongated and laterally compressed. Capsule small, ellipsoid or ovoid.

# KEY TO ISOCHILUS

- A. Flowers in a loose distichous or occasionally unilateral raceme, one or only a few; leaf-sheaths more or less verrucose

Leaves narrowly linear, strict or somewhat erect-spreading; flowers small, mostly less than 8 mm. long, one to several, commonly distichous

. . . . . 1. *Isochilus linearis*



Leaves oblong to linear-lanceolate, short, erect-spreading; flowers about 8 mm. long, commonly distichous . . . . .

2. *I. linearis* var. *carosiflorus*



Leaves linear, strict; flowers large, 1 cm. or more long, commonly unilateral . . . . .

3. *I. linearis* var. *unilateralis*

- AA. Flowers in a dense compact unilateral raceme, usually numerous; leaf-sheaths characteristically smooth and green-spotted or verrucose



Leaves oblong-ligulate to oblong-lanceolate, erect-spreading; leaf-sheaths densely brownish verrucose . . . . .

5. *I. major* var. *alatus*



Leaves linear, strict, often closely appressed to the stem; leaf-sheaths commonly smooth . . .

6. *I. major* var. *Amparoanus*



Leaves linear-lanceolate, somewhat spreading or occasionally strict; leaf-sheaths commonly smooth . . . . . 4. *Isochilus major*

1. **Isochilus linearis** (*Jacq.*) *R. Brown* in Aiton Hort. Kew. ed. 2, 5 (1813) 209—*Cogniaux* in Martius Fl. Bras. 3, pt. 5 (1898) 3, t. 1—*Schweinfurth* in Bot. Mus. Leaflet. Harvard Univ. 8 (1940) 44.

*Helleborine tenuifolia repens* Plumier Cat. Pl. Amer. (1703) 9.

*Serapias foliis linearibus; radice repente, floribus spicatis* Plumier Pl. Amer. (ed. Burm.) (1758) 177, t. 182, fig. 1.

*Epidendrum lineare* Jacquin Select. Stirp. Amer. (1763) 221, t. 131, fig. 1.

*Cymbidium lineare* Swartz in Nov. Act. Upsal. 6 (1799) 72—*Willdenow* Sp. Pl. 4 (1805) 97.

*Leptothrium lineare* Kunth ex Steudel Nomencl., ed. 2 (1840) 32.

*Isochilus leucanthus* Rodriguez Gen. & Sp. Orch. Nov. 1 (1877) 47.

*Isochilus linearis* *R. Brown* var. *β. leucanthus* *Cogniaux* in Martius Fl. Bras. 3, pt. 5 (1898) 4.

*Isochilus pauciflorus* *Cogniaux* in Urban Symb. Antill. 6 (1910) 459.

*Isochilus Langlassei* Schlechter in Fedde Repert. 16 (1920) 442.

*Isochilus peruvianus* Schlechter in Fedde Repert. Beih. 9 (1921) 79; ex *Mansfeld* in Fedde Repert. Beih. 57 (1929) t. 116, Nr. 455.

*Isochilus brasiliensis* Schlechter in Fedde Repert. Beih. 9 (1921) 80; in Fedde Repert. Beih. 48 (1930) t. 39, fig. 155.

*Isochilus linearis* is related to var. *unilateralis* primarily through the linear leaves and verrucose leaf-sheaths. It is related to var. *carnosiflorus* through the verrucose leaf-sheaths and through the type of flowers which are commonly arranged in a loose distichous raceme. The flowers are variously colored. Collectors' notes give



the color as "white", "orange-yellow", "brick-red", "orange", "rose-purple with 2 dark stains on the lip", "vermillion-orange", "red-violet", "purple", "flame scarlet", "bright red", "cerise pink", "violet" and "lilac".

This is the most common and widespread *Isochilus*. It is found from near sea level up to 3900 meters altitude in cloud forests in Mexico, throughout Central America and the West Indies, and in the northern half of South America. It occurs as a terrestrial, on rocks and logs, or on various species of trees, mainly in pine-oak forests.

Cogniaux proposed *I. pauciflorus* based primarily on a one- to few-flowered plant in contrast to his so-called numerous-flowered *I. linearis*. An examination of Jacquin's figure of *Epidendrum lineare*, upon which *Isochilus linearis* is based, shows a three-flowered plant. This type of few-flowered plant illustrated by Jacquin is the common form found in the West Indies. It is apparent that Cogniaux described as a new species the typical form of *I. linearis* and considered as *I. linearis* a more uncommon form of the species. The secondary characters given for each of Cogniaux' segregates have been found to intergrade too freely to be of specific value.

A study of the original description and an examination of Schlechter's illustration of a flower of *I. peruvianus* shows that it is referable to *I. linearis*. The vegetative description and floral analysis compare favorably with typical *I. linearis*.

An examination of a floral analysis of *I. brasiliensis* shows that the flowers of this concept are not unlike those of some of the forms of *I. linearis*. Apparently no formal description was ever written by Schlechter for *I. brasiliensis*.

## SPECIMENS EXAMINED:

MEXICO—"Sierra Madre", *Langlassé* 1023 (Type collection of *I. Langlassei*, isotype seen); Tamaulipas: *Palmer* 353; Michoacán: *Vera* 7054; Mexico: *Hinton* 899; Morelos: *Williams* 3828, *Juan G.* 2605, 2607; Guerrero: *Nagel & Juan G.* 3316, 1676, *Nagel* 3118, *Hinton* 14281; Chiapas: *Ghiesbrecht* 8, *Nagel* 5684.

GUATEMALA—Amatitlan: *Shannon* 3671; Chimaltenango: *Standley* 60075, 60924, *Skutch* 505; Guatemala: *Porter* 1, *Johnston* 1313, 1379, *Standley* 58440; Huehuetenango: *Skutch* 1041; Jalapa: *Steyermark* 32772, 32829; Quetzaltenango: *Skutch* 797 (in part); San Marcos: *Steyermark* 35809, 36048.

SALVADOR—Ahuachapán: *Standley* 20205.

HONDURAS—Colon: *Ames* II 187; Comayagua: *Edwards* 476 (in part), *Yuncker, Dawson & Youse* 6369; Tegucigalpa: *Edwards* 34, 121; also "Cortez", *Yuncker* 4854.

COSTA RICA—Cartago: *Standley* 39951; Guanacaste: *Dodge & Thomas* 6282, *Standley & Valerio* 44202, 46105; San José: *Standley* 32224, 34092; also "San Juan", *Jiménez* 819.

CUBA—Oriente: *Wright* 633, *Shafer* 3116, 3587, 8682, 8942; Santa Clara: *Britton* 5004, *Jack* 6515, 6865, 7058, *Smith, Hodgdon & Gonzalez* 3322.

JAMAICA—Orcutt 3027, *Britton* 3870, *Nichols* 131, *Wolle*.

HAITI—Leonard 9097, *Ekman* 469.

SANTO DOMINGO—*Fuertes* 652, 1905b, *Tuerckheim* 3386, *Taylor* 108.

PUERTO RICO—*Sintenis* 4378, 4437, 6236, *Horne* 5867, *Britton & Horne* 7491.

GUADELOUPE—(Gray Herb.).

DOMINICA—*Toepffer* 646, *Lloyd* 791.

MARTINIQUE—*Duss* 2079, *Hahn* 85, *Sieber*.

ST. VINCENT—*Smith* 471.

VENEZUELA—Barquisimeto: *Saer* 105; "Tovar", *Fendler* 1439.

BRAZIL—Bahia: (Herb. Ames); Minas Geraes: *Mexia* 4255a; Paraná: *Dusén* 17081; also "Santo Angelo", *Lindman* 1125 and "Brazil", *Sello*.

BOLIVIA—La Paz: *Buchtien* 5018; *Bang* 2913.

PARAGUAY—"Estancia Primera", *Rojas* 5309.

ARGENTINA—Jujuy: *Fries* 206, *Venturi* 5390.

## 2. *Isochilus linearis* (Jacq.) *R. Brown* var. *carnosiflorus* (Lindl.) *Correll* comb. nov.

*Isochilus carnosiflorus* *Lindley* in *Paxton Mag. Bot.* 11 (1844) 213; 12 (1845) 263.

*Isochilus crassiflorus* *A. Richard & Galeotti* in *Ann. Sci. Nat., ser. 3*, 3 (1845) 22.



*Isochilus linearis* var. *carnosiflorus* is related to *I. major* var. *alatus* in the shape and arrangement of the leaves and in the verrucose leaf-sheaths. Except for the difference in the type of inflorescence, some of the forms of var. *carnosiflorus* approach var. *alatus* very closely. It is allied to *I. linearis* var. *unilateralis* in the rather large flowers and in the type of inflorescence in some of the plants. The differences in the leaves, however, immediately distinguish these two varieties.

According to collectors' notes, the flowers are "magenta and wax-like", "dark rose and wax-like", "purplish pink with 2 dark stains on lip", "red-purple", "rose-purple", "purple", "pink", "bright magenta" and "mallow-purple". It would seem that the flowers are quite fleshy in this variety since they are characterized by some collectors as "wax-like".

This variety is found from near sea level up to 2800 meters altitude in Mexico, British Honduras, Guatemala, Honduras and Costa Rica. It occurs usually in dense shade and is commonly found on mangroves at sea level, on coco plum, in mixed oak-pine forests or on rocks.

An examination of a drawing of the habit and floral analysis of *I. crassiflorus* by Richard shows the characteristic leaves and inflorescence of var. *carnosiflorus*. The floral analysis also agrees favorably with that of var. *carnosiflorus*.

#### SPECIMENS EXAMINED:

MEXICO—Vera Cruz: *Conzatti & Gonzalez C/640*; Guerrero: (collector?). No. 1889 (Herb. Ames); Oaxaca: *Nagel 5300*, *Nagel & Juan G. 6454*.

BRITISH HONDURAS—*Schipp 776*, *Bartlett 11287*.

GUATEMALA—Alta Verapaz: *Johnson 295, 1067*; Izabal: *Steyermark 38614*; San Marcos: *Steyermark 36697a*; Suchitepéquez: *Steyermark 35250*.

HONDURAS—Atlantida: *Standley 54184, 55439*, *Davis*.

COSTA RICA—Alajuela: *Valerio 2538*, *Jiménez L. & Lankester 2075*;



Cartago: Lankester 1066; Guanacaste: Standley & Valerio 44320, 44426, 44465, 44608, 44724, 44849, 45140, 45314, 45653, 45977, 46437; Limón: Standley 37540; San José: Alfaro 120 (in part).

**3. *Isochilus linearis* (Jacq.) R. Brown var. *unilateralis* (Robins.) Correll comb. nov.**

*Isochilus unilaterale* Robinson in Proc. Amer. Acad. 29 (1894) 323.

*Isochilus linearis* var. *unilateralis* has the largest flowers of any *Isochilus*. In this respect it approaches *I. major*. However, the few-flowered loose inflorescence, narrow leaves and verrucose leaf-sheaths place it closer to *I. linearis*. The flowers are as much as 1.5 cm. long and, in some of the specimens, are exserted above the leaves by the peduncle-like upper part of the stem. They are described by collectors as "pink", "phlox-pink", "phlox-purple" and "rose-purple". The linear leaves are strictly erect or only slightly spreading.

This variety is apparently restricted to a small region in east central Mexico where it is found on trees in humid forests from 500 to 1400 meters altitude.

**SPECIMENS EXAMINED:**

MEXICO—San Luis Potosi: Pringle 5116 (Type of *I. unilaterale*), Nagel 5106, Nagel & Juan G. 4796, Dino 6954; Tamaulipas: Viereck 953, Roszinsky 663; Puebla: Östlund 5862.

**4. *Isochilus major* Chamisso & Schlechtendal in Linnaea 6 (1831) 60.**

? *Isochilus latibracteatus* A. Richard & Galeotti in Ann. Sci. Nat., ser. 3, 3 (1845) 22.

*Isochilus chiriquensis* Schlechter in Fedde Repert. Beih. 17 (1922) 25.

This species typifies the second line of development found in *Isochilus*. The comparatively large unilateral raceme and lanceolate leaves distinguish it at once from *I. linearis* and its varieties. The upper leaves which commonly half conceal the inflorescence are nearly always

tinged the color of the flowers. The flowers, according to collectors' notes, are "rose-colored", "lavander", "white stained magenta-purple on the lip", "white with pink hue", "pink" and "pink, at lip-base 2 darker stains".

*Isochilus major* is found on the mainland from southern Mexico to Panama. It is represented from Jamaica by two collections, one of which is doubtful material. It occurs as a terrestrial or epiphyte from about 600 to 2000 meters altitude in open or cloud forests, and is often found growing in large clumps on rocks.

An examination of a photograph of the type of *I. latibracteatus* shows that it is probably referable to the typical form of this species. However, the leaves are rather narrow for *I. major*; it may be that, if it were possible to examine the type, it would be found to be referable to var. *Amparoanus*.

An examination of an isotype of *I. chiriquensis* in the Ames Herbarium (Sheet No. 23831) and a comparison of it with a photograph of the type of *I. major* show that these concepts are essentially the same. Vegetatively they are an exact match. However, *I. chiriquensis* has fewer flowers in a shorter and less compact inflorescence than that of typical *I. major*.

#### SPECIMENS EXAMINED:

MEXICO—Colima: *Reko* 4829; Michoacán: *Aiken* 1378; Puebla: *Hultén* 4931; Vera Cruz: *Linden* 69 (Type of *I. major*, photograph seen), *Galeotti* 5170 (Type of *I. latibracteatus*, photograph seen), *Bourgeau* 66, *Pringle* 15588, *Maury* 361, *Foster* 1, 15, 18; Chiapas: *Nagel* 4376, 5653.

GUATEMALA—Jutiapa: *Steyermark* 31893.

HONDURAS—Comayagua: *Edwards* 285, 476 (in part); Tegucigalpa: *Edwards* 15, 16.

COSTA RICA—Cartago: *Stork* 391.

PANAMA—Chiriquí: *Powell* 98 (Type of *I. chiriquensis*, isotype seen), 3380, *Killip* 3532, *Woodson*, *Allen & Seibert* 1003.

JAMAICA—*Maxon* 10262, *Maxon & Killip* 413.



5. ***Isochilus major* Cham. & Schlecht. var. *alatus***  
(Schltr.) Correll comb. nov.

*Isochilus alatus* Schlechter in Fedde Repert. 10 (1912)  
360.

*Isochilus major* var. *alatus* and *I. major* are similar in their leaf size and type of inflorescence, both of which are larger than those of var. *Amparoanus*. They differ somewhat in the shape of the leaves and in the leaf-sheaths. The leaves of var. *alatus* are oblong and the leaf-sheaths are densely brownish verrucose, whereas the leaves of *I. major* are lanceolate and the leaf-sheaths are smooth.

This variety is apparently extremely rare, since it is represented only by the type collection of *I. alatus* from Guatemala.

SPECIMENS EXAMINED:

GUATEMALA—Alta Verapaz: Epiphyte in woods, Cobán, July 1907, *Tuerckheim II 1831* (Type of *I. alatus*, isotype examined).

6. ***Isochilus major* Cham. & Schlecht. var. *Amparoanus***  
(Schltr.) Correll comb. nov.

*Isochilus Amparoanus* Schlechter in Fedde Repert.  
Beih. 19 (1923) 27.

*Isochilus major* var. *Amparoanus* has only the characteristic inflorescence of this group in common with var. *alatus*. It agrees with *I. major* in the typically smooth leaf-sheaths and in the type of inflorescence. It is related to *I. linearis* var. *unilateralis* in the strict linear leaves and in the comparatively rather large flowers of some of its forms. The flowers are said by collectors to be "lavender", "purple", "rose-purple", "pinkish purple", "phlox-purple", "rose-color" and "orange-red".

This variety is found in Mexico and through Central America to Costa Rica. It occurs at from 670 to 2300 meters altitude where it is found as a terrestrial, on rocks,

in lava fields, on trees in dry oak forests or in moist tropical forests.

#### SPECIMENS EXAMINED:

MEXICO—Michoacán: *Hinton* 13678, *Nagel* 2235; Vera Cruz: *Foster* 27, *Conzatti* 353, *Östlund* 2606, *Purpus* 2137, 3892, 16300; Oaxaca: *Nagel* 5371; Chiapas: *Schmeling* 6273, *Nagel* 5696, *Matuda* 1813, 2581.

GUATEMALA—Alta Verapaz: *Standley* 70923, *Smith* 1665; Chimaltenango: *Johnston* 1381; Chiquimula: *Steyermark* 31505; Guatemala: *Aguilar* 172; Huehuetenango: *Seler* 2724; Jalapa: *Kellerman* 7868; Quetzaltenango: *Skutch* 797 (*in part*); Retalhuleu: *Rojas* 444; San Marcos: *Steyermark* 37630; Santa Rosa: *Maxon & Hay* 3374, *Heyde & Lux* 3864, 6243; Zacapa: *Steyermark* 29607; also "Chocola", *Morton* 263.

SALVADOR—San Salvador: *Calderon* 62; San Vicente: *Standley* 21547.

HONDURAS—Comayagua: *Edwards* 66, 166, 229.

COSTA RICA—Cartago: *Standley* 36015, *Danielson* (*Stork* 1190); Guacacaste: *Standley & Valerio* 45100; San José: *Alfaro* 120 (*in part*).

#### EXCLUDED SPECIES

So far as we know, the following citations include all of the concepts originally proposed for the genus *Isochilus*, or wrongly attributed to it, which have subsequently been transferred to other genera.

*Isochilus cernuum* Lindley in *Ann. & Mag. Nat. Hist.*, ser. 1, 10 (1842) 184 = ***Epidendrum Karwinskii Reichb.f.***

*Isochilus dubius* A. Richard & Galeotti in *Ann. Sci. Nat.*, ser. 3, 3 (1845) 23 = ***Scaphyglottis livida (Lindl.) Schltr.***

*Isochilus elegans* Focke in *Tijdschr. Natuurk. Wetensch.* 4 (1851) 68 = ***Epidendrum stenopetalum Hook.***

*Isochilus fusiforme* Lindley *Gen. & Sp. Orch. Pl.* (1831) 113 = ***Epidendrum fusiforme (Lindl.) Reichb.f.***

*Isochilus globosum* (Jacq.) Lindley *Gen. & Sp. Orch. Pl.* (1831) 112 = ***Jacquiniella globosa (Jacq.) Schltr.***

*Isochilus graminifolius* HBK. *Nov. Gen. & Sp.* 1 (1816) 340, t. 78 = ***Maxillaria graminifolia (HBK.) Reichb.f.***



*Isochilos graminifolium* Sprengel Syst. Veg. 3 (1826) 734=**Dichaea graminoides** (Sw.) Lindl.

*Isochilus graminoides* (Sw.) Hooker Exot. Fl. 3 (1823-27) t. 196=**Dichaea graminoides** (Sw.) Lindl.

*Isochilus grandiflorum* Lindl. in Bot. Reg. 27 (1841) sub t. 1=**Maxillaria Haenkei** Correll nom. nov. (*Camaridium grandiflorum* Schltr. in Fedde Repert. Beih. 9 (Sept. 1921) 165, non Ames in Proc. Biol. Soc. Wash. 34 (Dec. 1921) 149).

Since *Maxillaria* and *Camaridium* are considered congeneric, *Camaridium grandiflorum* is invalidated. Furthermore, the prior use of the combination *Maxillaria grandiflora* by Lindley necessitates a new name for this species. The name proposed, *M. Haenkei*, is in honor of its collector.

*Isochilus lancifolium* (Presl) Lindley Gen. & Sp. Orch. Pl. (1831) 113=**Elleanthus lancifolius** Presl.

*Isochilus linifolium* (Presl) Lindley Gen. & Sp. Orch. Pl. (1831) 113=**Elleanthus linifolius** Presl.

*Isochilus lividum* Lindley in Bot. Reg. 25 (1839) Misc. p. 36=**Scaphyglottis livida** (Lindl.) Schltr.

*Isochilus prolifer* R. Brown in Aiton Hort. Kew., ed. 2, 5 (1813) 209=**Scaphyglottis prolifera** (R. Br.) Cogn.

*Isochilus proliferum* (R. Br.) Lindley Gen. & Sp. Orch. Pl. (1813) 113, excl. syn. Swartz=**Scaphyglottis prolifera** (R. Br.) Cogn.

*Isochilos ramosum* (Jacq.) Sprengel Syst. Veg. 3 (1826) 734=**Epidendrum ramosum** Jacq.

*Isochilus ramosus* Focke in Tijdschr. Natuurk. Wetensch. 4 (1851) 69=**Epidendrum strobiliferum** Reichb.f.

*Isochilus teretifolium* (Sw.) Lindley Gen. & Sp. Orch. Pl. (1831) 112=**Epidendrum teretifolium** Sw.

## II. THE IDENTITY OF MORMODES LINEATUM AND M. HISTRIO

In publishing the original description of *Mormodes lineatum* Batem. in 1841, Lindley wrote that the plant was "a native of Guatemala, whence it had been sent by both Mr. Skinner and Mr. Hartweg." The species was described as having "dull olive-green flowers, striped and spotted with dull brown." The linear, fleshy, sparsely pilose, incurved lip was described as having a tooth on each side near the base which varied in length from "half a line to two lines," approximately one to four millimeters long.

A year later, 1842, a plant was illustrated as *M. lineatum* in the Botanical Register (Vol. 28, t. 43). The flowers of this plant were apparently so different from the flowers described the year before that Lindley wrote at the time, "The flowers, when they first appeared, were dull olive green, and by no means handsome; they have since acquired a bright warm tint, and the markings upon them have increased in intensity till they have become quite ornamental." The densely pilose lip of the flowers, instead of having a small tooth on each side near the base (as given in the original description), is clearly shown as prominently three-lobed; the twisted lateral lobes being nearly as long as the mid-lobe. It is evident that the plant illustrated as *M. lineatum* was not the same species as that originally described as *M. lineatum*.

In 1859, Linden and Reichenbach filius described *M. histrio* from Mexico. The flowers, which were said to be similar to those of *M. lineatum* (a statement apparently based on the illustration in the Botanical Register), were described as having purplish sepals and petals and a yellow lip. The lip was described as smooth and three-lobed. The lateral lobes were said to be falcate and twisted; the mid-lobe linear and acute.



An examination of an analytical drawing in the Ames Herbarium of a specimen of *M. histrio* from the Reichenbach Herbarium shows flowers which, except for the lack of pilosity on the lip (a character of no diagnostic value because of its variability), are identical with those illustrated as *M. lineatum* in the Botanical Register. The twisted lobes of the lip are nearly as long as the mid-lobe.

From the above it would seem that Bateman's description of *M. lineatum* must have been based on either the Skinner or the Hartweg collection, but not on both; the following year the other collection, an entirely different species, produced flowers and was forthwith illustrated but erroneously designated as *M. lineatum*. This plant was in reality the species later described as *M. histrio*.

It may be concluded that the plant illustrated in the Botanical Register should be known as *M. histrio* rather than *M. lineatum*. Also, specimens which in the past have been attributed to *M. lineatum*, based on this illustration, are in reality *M. histrio*. It is necessary for one to go back to Bateman's original description to obtain a clear conception of the true *M. lineatum*.

A recent collection from Guatemala (*Steyermark 39868*) was found to have flowers whose lip (fig. 1) is identical in shape with that originally ascribed to *M. lineatum*. So far as we know, this is the only collection of this species since it was originally described one hundred years ago. It is evidently endemic to Guatemala where it is extremely rare, while *M. histrio*, also quite rare, occurs in Mexico, Guatemala and Honduras.

**Mormodes lineatum** *Bateman ex Lindley* in Bot. Reg. 27 (1841) Misc. p. 52.

GUATEMALA—Guatemala: Guatemala City, alt. 1600 meters, cultivated in the garden of Don Mariano Pachecho Dec. 29, 1939, J.

*A. Steyermark* 39868 (Herb. Ames, Herb. Field Mus.). (It is assumed that this plant was obtained in nature from some part of Guatemala).

**Mormodes histrio** *Linden & Reichenbach filius* in Hamb. Gartenz. 15 (1859) 54.

*Mormodes lineatum* Lindley in Bot. Reg. 28 (1842) t. 43 (only as to plate, not as to description).

MEXICO—Chiapas: Soconusco system, above Huixtla, on decaying tree trunk, open space in humid forest, sepals and petals claret brown, lip brown-vinaceous, underneath olive-green, plant 1 foot high, 18 internodes, about 1000 meters altitude, *O. Nagel* 4374 (Herb. Ames); Mt. Ovando, at 1250-2370 meters altitude, July 1938, *E. Matuda* 2578 (Herb. Univ. Michigan).

GUATEMALA—Sacatepéquez: On log, sepals maroon, lip green and white, large elongate bulbs, Barranco Hondo, lower slopes of Volcán de Fuego, altitude about 1800 meters, Dec. 16, 1938, *P. C. Standley* 60258 (Herb. Ames, Herb. Field Mus.).

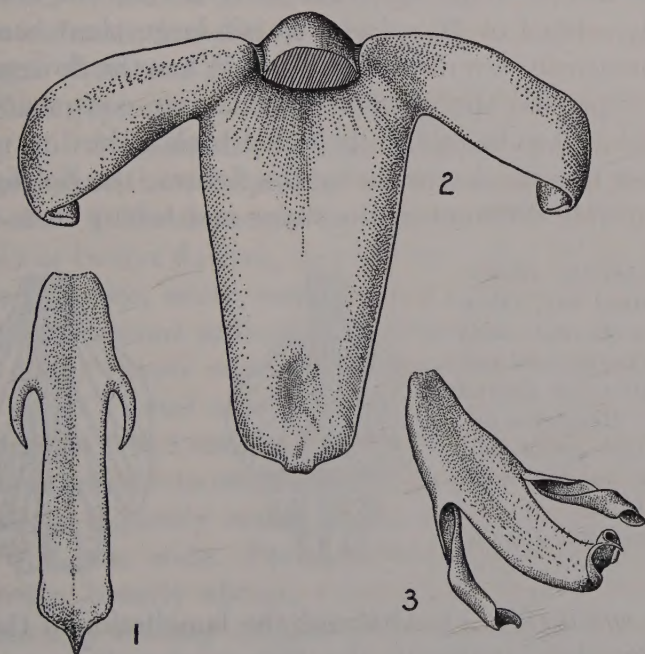
HONDURAS—Comayagua: Siguatepeque, epiphyte, open mountain forest, petals and sepals wine color, lip yellow, column pale green, 3700 feet altitude, Jan. 30, 1933, *J. B. Edwards* 359 (Herb. Ames); Siguatepeque, epiphyte, open pine forest, sepals light green with heavy dark purple stripes and dots, petals light green with fewer dark purple stripes and dots, lip yellow with few purple dots and covered with minute yellow hairs, column yellow, 3700 feet altitude, Oct. 9, 1932, *J. B. Edwards* 281 (Herb. Ames).

### III. EVIDENCES OF FLORAL POLYMORPHISM IN THE GENUS MORMODES

The flowers in the genus *Mormodes* have long been known to be exceedingly variable in color and size. Recently two collections of *M. histrio* were noted which much more definitely establish the existence of floral polymorphism in the genus. A collection from Honduras (*Edwards* 359) has flowers on the same raceme which differ in size, texture, shape and the presence or absence of hairs on the lip. The smallest flowers are somewhat fleshy and have densely pilose lips. The medium-sized flowers are subcoriaceous and have smooth lips. (The lip illustrated in figure 3 is taken from a flower somewhat



intermediate between the smallest and medium-sized flowers and may be considered as typical of *M. histrio*. The largest flowers on the raceme are rigidly coriaceous and might well be taken for those of an entirely different species. The lateral lobes of the lip (fig. 2) are rigidly divaricate and scarcely or not at all twisted but merely slightly rolled up at the apex. This same collection also has racemes composed of flowers of only one type, either the largest or the smallest. A collection from Guatemala (*Standley 259*) also shows similar evidences of floral polymorphism but has only large and small flowers on the same raceme.



1. *Mormodes lineatum*, lip, when flattened, two and one half times natural size. 2 and 3, *Mormodes histrio*, two types of lip taken from the same raceme, natural position, two and one half times natural size.

*Drawn May 1941 by G. W. DILLON*

#### IV. ANOTHER HEXALECTRIS FROM MEXICO

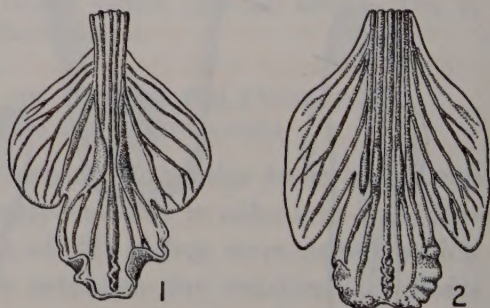
The first described species of *Hexalectris*, *H. spicata* (Walt.) Barnh., occurs from West Virginia (Pendleton County), Maryland and Virginia, south to Sarasota County, Florida and west to Indiana, Kentucky, Missouri, Arkansas, Arizona, New Mexico and Mexico, where it was recently discovered in the State of Nuevo Leon. The second described species, *H. mexicana* Greenm., occurs in western Texas and generally throughout Mexico.

Recently my colleague, Dr. L. O. Williams, described two new species from Mexico, *H. parviflora* and *H. brevicaulis* (Amer. Orch. Soc. Bull. 9, (1940) 125, t.).

The species in question, *Hexalectris revoluta*, is most closely related to *H. spicata*. It is a large plant bearing comparatively few distant flowers. When the flowers are fully expanded the sepals and petals are conspicuously revolute, often being tightly rolled back a third or more of their length. As shown by the figures, the lip (fig. 2) is distinctly different in the shape and lobing from that

1. *Hexalectris spicata*, lip, spread out, taken from a typical plant from Florida, two and one half times natural size. 2. *Hexalectris revoluta*, lip, spread out, two and one half times natural size.

Drawn May 1941 by  
G. W. DILLON



of *H. spicata* (fig. 1). Although the lamellation of the lip is somewhat similar in the two species, it is not so prominent in *H. revoluta*. Instead of five prominent keels at the base of the middle lobe as in *H. spicata*, the lip of *H. revoluta* has four keels which are only slightly raised.



**Hexalectris revoluta** *Correll sp. nov.*

Herbae erectae, saprophyticae. Caules simplices, nudi, robusti, bracteati. Inflorescentia racemosa, pauciflora. Bractee inflorescentiae ovatae, acutae, concavae. Sepala et petala apice conspicue revoluta. Sepalum dorsale oblongo-ellipticum, obtusum. Sepala lateralibus obliqua, elliptica vel elliptico-lanceolata, obtusa vel subacuta, rare retusa. Petala obliqua, elliptica vel elliptico-obovata, obtusa. Labellum in circuitu late ellipticum, profunde trilobatum, basi late cuneatum; lobi laterales oblongi, obtusi; lobus medius obovato-cuneatus, apice truncatus vel retusus, margine superiore undulato et nervo medio incrassato; lamina prominenter nervosa nervis plusminusve carinatis, lamellis quatuor parvis in lobi medii basi ornata. Columna generis.

Plant saprophytic, erect from a fleshy rhizome, 3-4.5 dm. tall. Stems stout, simple, aphyllous, provided with several short broad clasping bracts, apparently purplish in color. Inflorescence a few-flowered raceme, with as many as twelve flowers, up to 20 cm. long. Floral bracts broadly ovate, acute, concave, 1-1.4 cm. long. Flowers with rather stout pedicellate ovaries which are about 1.5 cm. long. Sepals and petals conspicuously revolute at the apex. Dorsal sepal oblong-elliptic, bluntly obtuse, concave, 1.6-2.1 cm. long, 6-7 mm. wide. Lateral sepals oblique, elliptic to elliptic-lanceolate, obtuse to subacute or rarely minutely retuse at the apex, 1.5-2 cm. long, 6.5-7.5 mm. wide. Petals oblique, elliptic to elliptic-obovate, bluntly obtuse, 1.5-1.9 cm. long, 6-7.5 mm. wide. Lip broadly elliptic in outline, deeply 3-lobed, broadly cuneate at the base, 1.4-1.8 cm. long, 9-13 mm. wide across the lateral lobes; lateral lobes oblong, obtuse, free part 5-6 mm. long and 3.5-4.5 mm. wide; mid-lobe obovate-cuneate, truncate or retuse at the apex, upper margin undulate, with the central nerve prominently



thickened above, 7–8.5 mm. long, 5–6 mm. wide across the apex; lamina prominently nervose, with all the nerves more or less raised and thickened, adorned with four small somewhat equal lamellae at the base of the mid-lobe. Column clavate, arcuate, about 1.5 cm. long.

MEXICO—Nuevo Leon: Sierra Madre Oriental, lower San Francisco Canyon, about 15 miles S. W. of Galeana, alt. 7500-8000 ft., sparse in open oak wood, June 10, 1934, C. H. & M. T. Mueller 767 (TYPE in Herb. Ames No. 40617); Sierra Madre Oriental, Canyon above Alamar, about 15 miles S. W. of Galeana, alt. 5000-6000 ft., common in moist open wood, June 2, 1934, C. H. & M. T. Mueller 700 (Herb. Ames No. 40619); Sierra Madre Oriental, Canyon de los Charcos y Mesa de la Camisa, above Alamar, about 15 miles S. W. of Galeana, rare in open oak wood in the upper canyon, June 4, 1934, C. H. & M. T. Mueller 733 (Herb. Ames No. 40618).

The following key is included for convenience in identifying all of the known species of *Hexalectris*.

1. Petals linear-oblongate, less than 2.3 mm. broad; lip less than 7 mm. broad

*Hexalectris parviflora*

1. Petals elliptic-oblongate to elliptic-obovate, 3.5 mm. or more broad; lip more than 8 mm. broad

2. Lateral sepals more than 2.3 cm. long; lip thickened along the median line and with radiating costae

*Hexalectris brevicaulis*

2. Lateral sepals less than 2 cm. long; lip lamellate

3. Lip shallowly 3-lobed; lateral lobes of lip broadly rounded with the free part less than 2 mm. long

*Hexalectris spicata*

3. Lip deeply 3-lobed; lateral lobes oblong to elliptic with the free part more than 3 mm. long

4. Sepals and petals strongly revolute; lip tapering at the base, the lamina longer than broad

*Hexalectris revoluta*

4. Sepals and petals spreading, not strongly revolute; lip with a slender claw, the lamina about as broad as long or broader

*Hexalectris mexicana*